

needlessly pester nor afford the notoriety of cheap martyrdom to any man sufficiently wrong-headed to be quite determined to resist the vaccinal protection of his child.

As regards the example of Germany, however, and the prospect of similar immunity, which I have ventured to hold forth as an inducement for the passing of a Revaccination Act in this country, it may well be asked, May not the operation of a Conscience Clause result in a condition of national protection far short of that of Germany? It is unsafe to prophesy here, but personally I am not very much afraid of that contingency. With such a well-organised system of vaccination and revaccination as could be easily and, I believe, very economically established, there would, I think, be comparatively little default throughout the country as a whole. The latest returns show that in London conscientious objection is registered with regard to about 1 per cent. of the children, and in the rest of England about 5 per cent. These figures might in the future alter either upwards or downwards, but with a well-thought-out Conscience Clause the change might be downwards rather than upwards. In some special localities, however, the amount of default might, at least for a time, be very considerable, and such places would be a danger both to themselves and to their neighbours. In Germany, a large part of the trifling amount of small-pox that still remains occurs near the frontiers where there is opportunity for importation of the infection from other less protected countries. We, however, have a sea boundary and are less exposed to such risks, so that the existence in our midst of imperfectly protected places might not be more than equivalent to the risk which Germany runs from its imperfectly vaccinated neighbours. Such places in England would have the benefit of being surrounded by a vaccinated and revaccinated nation. Small-pox would not readily reach them, and when it did the surrounding communities would, through their systematic revaccination, be in a much better position than at present to resist the virulose invasion. Moreover, when once small-pox gets a good footing (though, unfortunately, not until it really has a good footing) in an imperfectly protected community, it has a wonderful effect in temporarily promoting vaccination. When Gloucester had attained a higher percentage neglect of vaccination than any large town in England, the result of a great small-pox epidemic was to leave it the best revaccinated town in the realm. In presence of an outbreak in future, it would not be in the least surprising to find the names of some children appearing on two lists in the course of the same year, first as subjects of conscientious objection and later as subjects of successful vaccination. Looking to all the facts of the case, I think this country may be able to afford a Conscience Clause, and it would certainly be infinitely better off under a Revaccination Act with a Conscience Clause than without any Revaccination Act at all.

As reference has repeatedly been made here to the example of Germany, it may be proper just to indicate, in a sentence or two, its position with regard to vaccination and small-pox. The facts are taken from a very useful tract published by the council of the British Medical Association.¹ In Germany, vaccination of children in the course of their second year is compulsory, and also revaccination of all school children in their twelfth year. That has been the law since 1874. In the nine years 1866-74, the small-pox deaths per million in Prussia were, respectively, 620, 432, 188, 194, 175, 2432, 2624, 357, 95. In the years 1875-1898, the corresponding figures have been 36, 31, 3, 7, 13, 26, 36, 36, 20, 14, 14, 5, 5, 3, 5, 1, 1, 3, 4, 3, 0.8, 0.2, 0.2, 0.4. In Austria, without compulsory vaccination, the annual rates 1887-1896 have been 440, 640, 520, 250, 290, 260, 250, 110, 47, 35. The figures for all Germany do not begin until 1886, and are as follows in the years 1886-99:—4, 3.5, 2.3, 4.1, 1.2, 1.0, 2.1, 3.1, 1.7, 0.5, 0.2, 0.1, 0.3, 0.5. In short, "small-pox epidemics are utterly abolished from Germany, and only a few scattered deaths occur each year, mostly on the frontiers (Russia and Austria)."

As illustrating what has been said already about the protection derived from living in a vaccinated and revaccinated community, I quote in conclusion the following passage regarding the Prussian army:—

"The law of 1874 made no difference in the vaccination of the Prussian army, which enjoyed good vaccination ever since 1834: every recruit being vaccinated on joining—twice if necessary. But the law of 1874, which only directly affected

infants and school children, made a great and striking difference in the small-pox mortality of the army. Previously there were a few deaths, one or two, almost every year, but after 1874 there was not a single death for ten years, and only two deaths (1884 and 1898) in the whole period 1875-98. The first death is that of a reservist twice unsuccessfully vaccinated in the army. This shows that the protection which an individual acquires by vaccination is increased by his being surrounded by a well-vaccinated community."

JOHN C. M'VAIL.

AN AMERICAN REPORT UPON THE WEST INDIAN ERUPTIONS.¹

DR. E. O. HOVEY, associate curator of the geological department of the American Museum of Natural History, New York, was sent by that institution to Martinique and St. Vincent to study the phenomena accompanying the great eruptions of Mont Pelée and La Soufrière of last year, and the report referred to below deals almost entirely with his personal observations. The report first discusses the May eruptions of La Soufrière, the author being a member of the first party, on May 31, to ascend that mountain after the eruptions of May 7 and 18. The party found that the old crater lake for which the volcano had been famous had disappeared, but that there was a small lake of (apparently) boiling water in the bottom of a precipitous pit nearly a mile in diameter at the top. The author and Dr. T. A. Jaggar, jun., who also was in the party making the ascent, estimated that the bottom of the pit was about 1600 feet below the part of the rim on which they were standing, or about 2400 feet below the highest part of the rim. A strong column of steam was rising, occasionally including clouds of dust, from the south-east quarter of the lake.

The wall between the great crater and the "New" or 1812 crater seemed intact, and from its lower third there issued a strong stream of water, apparently from waters then collecting in the 1812 crater. The rim of the crater and the upper part of the cone was covered with a thick mantle of mud, which rendered it unwise to attempt to reach the windward side of the volcano along the rim. Ten days later the author, accompanied by Mr. George C. Curtis, of Boston, who was his companion on the first and second ascent and during most of his stay on the islands, made a third and successful ascent from the windward side of the island and stood upon the peak between the two craters. It seemed evident that the small (1812) crater had not taken part in the May eruption, though the summit of the mountain was covered with clouds at the time of the visit.

The explosions attending the May eruptions of La Soufrière expended their strength radially in all directions from the crater. The principal evidence of this is the trees, which lie prone in directions pointing away from the crater, except for modifications due to local circumstances of topography. The roots of the upturned trees showed the effects of the sandblast action of the volcanic tornado, being worn and charred upon the portions toward the crater and preserving the fresh, unburned bark upon the protected parts. The explanation for the explosions suggested is that unusually great masses of superheated steam arriving at the lip of the crater could not find room for expansion upwards on account of the cushion-effect of the column of steam and lapilli preceding them, and the lapilli falling therefrom, and that they expanded with violence horizontally and downward, following the configuration of the mountain. Extensive landslides occurred for two or three miles along the leeward coast.

The particular feature of the May eruptions of La Soufrière was the enormous amount of dust which was thrown high into the air and distributed over a vast, elliptical area, the extent of which cannot yet be calculated for lack of data. The dust appears to have been carried much farther to the east and south-east by the upper currents of air blowing counter to the trade winds, than to the west by the trades. Reports from Barbados and from ships encountering the dust at sea indicate transport by the upper air currents at a rate of about thirty-two knots contrary to the direction of the prevailing surface wind. The other ejecta of the eruptions were fine and coarse lapilli, blocks and bombs. No stream of melted lava accompanied either of the outbursts in May. The lapilli first thrown out

¹ "Facts about Small-pox and Vaccination," &c. (British Medical Association, 429 Strand, W.C.) Price 1½d.

¹ Martinique and St. Vincent: a Preliminary Report upon the Eruptions of 1902, by Edmund Otis Hovey. *Bulletin American Museum Natural History*, vol. xvi. pp. 333-372, pl. xxxiii.-li. New York, October 11, 1902.

were fragments of the ancient lavas and tuff agglomerates in the throat of the volcano, those coming out afterwards were unoxidised and seemed to consist of new material, which had solidified, however, before reaching the atmosphere, though the larger lapilli in the September eruptions seemed to be bits of ancient lavas.



FIG. 1.—La Soufrière, St. Vincent, from Richmond estate. Effects of landslides and encroachment of the sea are shown along the coast. Photo by Clare E. Taylor.

The ejected blocks were of andesitic lavas, for the most part at least, and showed that they had been subjected to a high temperature, but had not been melted. Some of such blocks found four miles from the crater on the windward side were thought to weigh fifty pounds. The bombs noticed were of the "bread-crust" variety, similar to, but not as perfect as, those observed on Mont Pelée or those described by Johnston-Lavis and others from the 1888 eruption of Vulcano. Some of the bombs were of somewhat pumiceous and others of dense lava and they showed by their surface that they had been in a molten or half-molten condition in the throat of the volcano.

The great accumulations of hot lapilli and dust formed in the radial valleys, notably those of the Rozeau, Trespe and Wallibou rivers on the west and of the Rabaka dry river on the east, retained their heat for a long time after the eruptions and gave rise to secondary, or superficial, eruption phenomena of striking character and considerable interest. The river water and the water from the tropical showers percolating through the beds came into contact with the still highly-heated interior, causing violent outbursts of dust-laden steam. One such outburst from the Wallibou Valley near the sea, in the afternoon of May 30 sent up a column of such vapour fully a mile in height with all the cauliflower-like convolutions and mushroom-shaped top which are characteristic of a crater eruption-cloud. The Wallibou was so overloaded with volcanic ash that it could flow only in pulsations, intervals of from fifteen to forty seconds being needed for the stream to gather strength to push its way along with its load. The freshly fallen dry dust presented a ridged surface like that of wind-drifted snow.

The area of devastation on St. Vincent is very large in proportion to the total area of the island. After plotting it out carefully on the British Admiralty chart and measuring the area with a planimeter, I find that due to the May eruptions to be forty-six square miles, practically one-third the entire area of the island. From much of this devastated area, however, the ashes are being washed off so rapidly by the rain that vegetation is already asserting itself, and within another year crops will be growing there again.¹

¹ Newspaper reports and private advices from St. Vincent show that the area of devastation has been extended on the leeward side of the island by the tremendous eruption of September 3-4 about four miles south of the boundary indicated on the map herewith presented, while the whole western portion of the devastated area got a heavy additional coat of lapilli. The windward side did not suffer materially from this eruption, but the eruption of October 15-16 extended the area on the windward side.

The deaths on St. Vincent are assigned, principally, to the following causes:—(1) most important, asphyxiation by hot, dust-laden steam and air; then (2), burns due to hot stones, lapilli and dust; (3), blows by falling stones; (4), nervous shock; (5), burning by steam alone, and (6), probably, strokes of lightning. The deadly character of the dust-laden steam undoubtedly was enhanced by the presence of a considerable percentage of sulphur gases (SO_2 and H_2S). The action of steam would account for the burns received under the clothing where the clothing was not charred. No autopsies were made on the bodies of persons killed by either volcano, so far as the author is aware. The positions in which many of the bodies were found indicated death by asphyxiation.

Mont Pelée.

The area of devastation caused by the eruptions of Mont Pelée from May 5 to August 28 was less than that caused by the May eruptions of La Soufrière. The author, after plotting it upon the Admiralty chart and measuring it with a planimeter, estimates the area most seriously affected at thirty-two square miles, but observes that the eruptions since August 28 have greatly extended the area to the north, east and south-east, probably more than doubling the earlier devastation. The area of distribution of the ejecta cannot be estimated with any degree of accuracy for lack of data. There is no reason for supposing that it is much, if any, less than the area affected by La Soufrière. The

shocks or detonations from some, if not all, of the great eruptions were felt in Antigua, St. Kitts, St. Vincent, Trinidad and other islands, though not in the intervening islands of St. Lucia and Dominica.

The material ejected by Mont Pelée during the series of eruptions consists of dust in vast quantities, fine and coarse lapilli, bread-crust bombs of all sizes from one inch in diameter upwards, and blocks of small and great size, the cracked



FIG. 2.—St. Pierre Valley of the Roxelane or Rivière des Blanchisseuses in the northern part of the city, as it appeared May 22, 1902. Photo by E. O. Hovey.

condition of which shows that they had been highly heated. The bread-crust bombs are more perfect in their development than are those of La Soufrière. The largest mass which seemed to be a bomb, was one fifteen feet long, lying on the south-east slope of Morne Lacroix at an elevation of 3950 feet above the sea. Several bombs between 2 and 3 feet in longest dimension

were observed, and two were brought back to New York, one of which is now on exhibition in the American Museum. The largest ejected block noted was one upon the surface of the mud-flow between the Blanche and Sèche rivers, less than 200 yards from the sea-coast and about three miles from the crater. Its dimensions are $30 \times 24 \times 22$ feet, and it is of the light grey ancient andesitic lava, to be found in all places near the summit of the mountain. Many other great boulders, some of which are of nearly half the dimensions of the one just described, lie near by.

Four ascents of Mont Pelée, in the course of which the crater rim was traversed from the great chasm on the south-west along the southern and eastern edge, about two-thirds of the way around the circle, and the remainder also of the rim was clearly seen, the author was enabled to form a reasonably definite idea of the centre of activity of the volcano and what was going on therein. The crater is somewhat oval in shape, with the longest axis stretching north-east and south-west, and the highest point of the rim is on the north-east, and is what is left of the peak which is known as Morne Lacroix. The average between the readings of two barometers (one being in the hands of Mr. George C. Curtis, the companion of the author) determined the altitude of this peak as 4200 feet above the sea, the original height given upon the chart being 4428. The lava bed, forming what may be considered the rim of the crater on the south-east side of the gash, is 3350 feet above tide, while the real bottom of the gorge where it issues from the crater is 500 or 600 feet less in altitude. From this lava bed the rim rises rapidly (30° to 35°) to about 3750 feet above tide and then more gradually along the southern edge, until 3950 feet is reached on the eastern rim. The north-west side of the south-western gash is formed by a pinnacle of ancient lava, which appears to be about 4000 feet above the sea. From this point the rim drops somewhat toward the north, but gradually rises again toward the east until Morne Lacroix is reached again. This crater is estimated to be about half a mile across. The breadth of the rim varies from a mere knife-edge on the south, west, north and north-east sides to a sloping plateau 50 to 100 yards wide, on the eastern side. This plateau is the site of the shallow body of water known as Lac des Palmistes.

This lake basin was empty when visited by Prof. Heilprin on June 1, but was filled with dust and ashes when the author and Mr. Curtis visited the spot on June 18, 20 and 26. The author considers that the body of water known as Étang Sec, and not the Lac des Palmistes, was the real crater lake of Mont Pelée. The eruptions of the year 1902 have been for the most part from a vent which opened within the large crater at the head of the great gorge in the side of the mountain and just west of Étang Sec. The activity has built up a cone the top of which at the time the author left the island, July 6, was not less than 4000 feet above the sea, indicating a growth of 1600 to 1700 feet within the two months of volcanic action which had then taken place. There was a crater visible in the top of this inner cone the breadth of which can only be guessed at as being about 400 feet. Measurements of the angle of slope of the outer side of the cone determined it to be 38° to 40° , but there are precipitous portions. The material which rolls and slides down the south-west side of this cone continues directly into the cañon of the Blanche river. The steep-sided valley formed by the inner cone and the inner slopes of the great crater is a continuation of the gorge of the Blanche and rises rapidly from the south-western gash to the base of the rocky precipice of Morne Lacroix, where it may be 800 feet in depth. The valley probably continues round the northern side of the inner cone, rising in a spiral, for it appears at an elevation of at least 3600 feet on its eastern side between the inner cone and the rim of the crater on the north-west side of the great gash. There seemed to be a second centre of eruption of considerably less activity within the crater near the base of Morne Lacroix.

The history of the present series of eruptions may be epitomised somewhat as follows: the gradually returning activity of the volcano began to make itself very manifest in the latter part of April, since visitors to the crater found warm water in the basin of the Étang Sec on the 25th of that month, and the lake was "deep." Columns of dust-laden steam rose from an opening within the old crater on the east side of the Étang Sec and from one on the west side of the same basin, and cones rose about these openings. Water in large quantity collected in the old lake basin, assisted, perhaps, by a dam formed across the gorge by the ejecta from the western crater.

The water was heated by the action of volcanic forces. On May 5 the heated waters of the crater broke through this dam and rushed, as a deluge of mud and boulders of all sizes, down the gorge of the Blanche river, and overwhelmed the Guérin sugar factory, which was situated at the mouth of the stream. On May 8 began the series of great explosions which have sent steam, laden with sulphurous gases, dust, ashes and stones, again and again over the south-west slope of the mountain with the violence of a tornado, several times reaching to St. Pierre and beyond. The author would explain the blasts in the same way as in the case of St. Vincent, but the great gash in the side of the crater of Pelée and the position of the neighbouring ridges concentrated the force of the explosions in a certain direction and along a comparatively narrow zone—and the city of St. Pierre with its 26,000 inhabitants and thousands of refugees lay in an amphitheatre, a regular *cul-de-sac*, directly in the path of the blasts.

The ruins of the buildings in St. Pierre, the prone trees of the city, the dismantled guns in the batteries of Morne d'Orange and Pointe Ste. Marthe, the position of the iron statue of Notre Dame de la Garde upon the edge of the bluff below and fifty feet from its pedestal and many other circumstances, are the evidences that a blast of tornadic violence swept over the city of St. Pierre from the direction of the crater of Mont Pelée. The degree of destruction diminishes from north to south, and the amount of volcanic ash and stones deposited upon the city becomes less and less in the same direction.

The causes of death on Martinique were the same as on



FIG. 3.—Quarter-inch boiler-iron tanks in a distillery in the Fort-Quartier of St. Pierre, showing holes made by bombardment of stones from Mont Pelée eruption. Photo by E. O. Hovey.

St. Vincent, with the addition of crushing beneath falling walls and other objects and cremation in burning buildings. In connection with the eruptions of both volcanoes, the lack of respirable air probably caused many deaths.

The author came to the conclusion that there were no real craters or centres of primary eruption anywhere on Mont Pelée, outside of the great crater, though there has been much secondary action along the lower portion of the Blanche, Sèche, Falaise, Grande and Prêcheur rivers and other of the streams the sources of which are high up upon the slopes of the mountain. The secondary action was due, as in the Wallibou Valley and elsewhere on St. Vincent, to the admission of water to the heated interior of great accumulations of volcanic ash. Mud-flows and mud-torrents have been very numerous down the gorges of these streams and on the intervening plateaus. Some of these flows have been due to the breaking of the temporary dams caused by the quantities of loose ash thrown across the stream during the secondary outbursts, but the most destructive, with the exception of the one overwhelming the Guérin factory, have been due to the saturation by rain of the accumulations of dust on the inner and outer slopes of the crater rim, producing fluid masses which have run down the slopes of the mountain and the radial gorges with the destructiveness of avalanches.

The electrical displays in connection with each of the great outbursts were on the grandest possible scale. Such displays characterised the eruption of La Soufrière in 1812 according to contemporary reports.

The author and Mr. Curtis spent four nights (June 17-21) at Morne Rouge, and visited the crater on June 18 and 20. They felt then and told the people that there was great danger to the town in case of succeeding great eruptions, and they saw no reason to suppose that the activity of the volcano was lessening. It was evident that, if the inner cone kept on increasing in height until it considerably overtopped the eastern rim, or, if the greater activity shifted to the eastern vent within the crater and behind the wall formed by the inner cone, the great south-western gash and its cliffs on the north would lose their directive influence, and the force of the explosions would be expended radially in all directions. The early telegraphic reports of the eruption of August 30 stated that the remains of Morne Lacroix had been blown away, which indicated that the violent activity had shifted to the east. Later and authentic reports by Prof. Heilprin made it clear that Morne Lacroix had not suffered much additional damage, and his photographs taken after that eruption show the top of the inner cone well above the crater rim. Hence the former supposition cited above proved to be correct.

PRIZES PROPOSED BY THE ACADEMY OF SCIENCES FOR THE YEAR 1903.

IN geometry, the Francœur Prize (1000 fr.) is offered for discoveries or works useful to the progress of pure or applied mathematics; the Poncelet Prize (2000 fr.) for similar work done during the ten years preceding the award; and the Grand Prize of the Mathematical Sciences (3000 fr.).

In mechanics, the extraordinary Prize of 6000 francs for work tending to increase the efficiency of the French naval forces; the Montyon Prize (700 fr.) for inventing or perfecting instruments valuable in the mechanical arts; the Plumey Prize (2500 fr.) for improvements in connection with steam engines; and the Fourneyron Prize (1000 fr.) for a theoretical or experimental study of steam turbines.

In astronomy, the Pierre Guzman Prize (100,000 fr.) for finding a means of communicating with any planet other than Mars; the Lalande Prize (540 fr.) for the most interesting memoir or observation valuable to the progress of astronomy; the Valz Prize (460 fr.) and the G. de Pontécoulant Prize (700 fr.) for similar work.

In physics, the Hébert Prize (1000 fr.) for the author of the best treatise or most useful discovery for the commercial or practical use of electricity; the Hughes Prize (2500 fr.) for the best discovery or work contributing to the progress of physics; the Gaston Planté Prize (3000 fr.) for an important discovery or invention in the field of electricity.

In statistics, a Montyon Prize (500 fr.) for a work on French statistics.

In chemistry, the Jecker Prize (10,000 fr.) for work in organic chemistry, and the La Caze Prize (10,000 fr.).

In mineralogy and geology, the Delesse Prize (1400 fr.) for a work bearing on geological or mineralogical science.

In physical geography, the Gay Prize (2500 fr.) for a work having for its end the determination, as precisely as possible, of a series of geographical positions in a French colony.

In botany, the Grand Prize of the Physical Sciences (3000 fr.) for a research on the various modes of formation and development of the egg in the Ascomycetes and the Basidiomycetes; the Bordin Prize (3000 fr.) to demonstrate, by a study of numerous and varied types, the generality of the phenomenon of double fertilisation, or digamy, in the Angiosperms; the Desmazières Prize (1600 fr.) for the best work published in the course of the preceding year on Cryptogams; the Montagne Prize (1500 fr.) for work on the anatomy, physiology, development or description of the lower Cryptogams; the Thore Prize (200 fr.) for a work on the cellular Cryptogams of Europe.

In rural economy, the Bigot de Morogues Prize (1700 fr.) for any work tending to forward the progress of French agriculture.

In anatomy and zoology, the Savigny Prize (1300 fr.) for the assistance of young travelling zoologists with especial reference to the study of the invertebrate animals of Egypt and Syria; the Da Gama Machado Prize (1200 fr.) for the best memoir on the coloured portions of the tegumentary system of animals.

In medicine and surgery, a Montyon Prize, three prizes of 2500 fr. and three mentions of 1500 fr. for discoveries or inventions relating to the improvement of medicine or surgery; the

Barbier Prize (2000 fr.) for a discovery in medical, surgical or pharmaceutical science or in botany of curative value; the Bréant Prize (100,000 fr.) for the discovery of a radical cure for Asiatic cholera, or for pointing out the causes of the disease so that preventive measures leading to the eradication of the disease can be carried out; the Godard Prize (1000 fr.) for the best memoir on the anatomy, physiology and pathology of the génito-urinary organs; the Lallemand Prize (1800 fr.) for the encouragement of work on the nervous system; the Baron Larrey Prize (750 fr.) for a work treating of medicine, surgery or military hygiene; the Bellion Prize (1400 fr.); the Mège Prize (10,000 fr.); the Chaussier Prize (10,000 fr.) for the best book or memoir which has appeared during the last four years on legal or practical medicine.

In physiology, a Montyon Prize (750 fr.) for researches in experimental physiology; the Philipeaux Prize (900 fr.) for similar work; the Pourat Prize (1000 fr.) for a memoir on the action of high-frequency currents on the phenomena of life.

Other general prizes offered include the Binoux Prize (2000 fr.) for work on the history of science; Montyon Prizes (2500 fr. and 1500 fr.) for the discovery of any means rendering a dangerous trade less unhealthy; the Wilde Prize (4000 fr.) for a discovery or work on astronomy, physics, chemistry, mineralogy, geology or experimental mechanics; the Tchihatchef Prize (3000 fr.) for the encouragement of exploration in Asia by naturalists; the Cuvier Prize (1500 fr.); the Parkin Prize (3400 fr.); the Petit D'Ormy Prize (two prizes of 10,000 fr.), one for pure or applied mathematics and the other for work in natural science; the Boileau Prize (1300 fr.) for researches in hydraulics; the Estrade-Delcros Prize (8000 fr.); the Cahours Prize (3000 fr.) for the encouragement of young promising chemists; the Saintour Prize (3000 fr.); the Tremont Prize (1100 fr.); and the Gegner Prize (3800 fr.).

Of these, the prizes bearing the names of Pierre Guzman, Lalande, La Caze, Delesse, Desmazières, Wilde and Parkin are expressly stated to be offered without distinction of nationality.

LONDON CONFERENCE OF SCIENCE TEACHERS.

THE fifth annual conference of science teachers arranged by

Dr. Kimmins in connection with the Technical Education Board of the London County Council was held at the South-Western Polytechnic, Chelsea, on January 9 and 10. There was a larger attendance than in any previous year, between four and five hundred teachers and others accepting invitations to be present. Adopting the admirable practice of former meetings of selecting for consideration a subject which during the preceding year has been specially receiving attention in the educational world, arrangements were made to give the whole of the first two sessions to a discussion on the teaching of elementary mathematics, more especially the instruction in elementary geometry, and the interest manifested in the subject fully justified the choice. The third meeting was devoted to the teaching of botany in schools and colleges, and the last to methods of illustrating the instruction in chemistry by lecture experiments.

The customary invitation to teachers of science to send for exhibition during the conference home-made apparatus, designed by themselves to simplify their instruction, was not this year responded to with any heartiness. Leaving on one side the exhibits of the staff of the South-Western Polytechnic, the pieces of apparatus on view were few in number and in no way remarkable for the ingenuity displayed. At the same time, the experiments in plant physiology arranged by Mr. H. B. Lacey, of the Chelsea Polytechnic, to illustrate his paper at the third meeting, were well calculated to show teachers of botany how the odds and ends of everyday life can be utilised in the experimental illustration of science lessons.

The Teaching of Geometry.

The chairman of the Technical Education Board of the London County Council, Mr. H. Ward, presided at the opening meeting, and after emphasising the value of conferences to teachers, contrasted German and English systems of education; he based his hopes for the future of English education on a combination of the excellences of German methods with the elasticity and originality which characterise education in this country.